

REMARKS/ARGUMENTS

Reconsideration of the application is requested.

Claims 1, 3, 4 and 7-13 remain in the application and are subject to examination.

Claims 1, 3, 4, 7 and 8 have been amended. No claims have been added or canceled herein.

In "Claim Rejections – 35 USC § 102" or "Claim Rejections – 35 USC § 103," item 1 on pages 3-4 of the above-identified Office Action, claims 1, 3–4 and 7 have been rejected as being fully anticipated by U.S. Patent No. 5,294,300 to Kusuyama under 35 U.S.C. § 102(b) or § 103(a).

In "Claim Rejections – 35 USC § 103," item 2 on pages 4-5 of the Office Action, claims 1 and 7-13 have been rejected as being obvious over U.S. Patent No. 6,620,359 to Meza et al. (hereinafter Meza) under 35 U.S.C. § 103(a).

In "Claim Rejections – 35 USC § 103," item 3 on pages 5-6 of the Office Action, claims 1 and 7-13 have been rejected as being obvious over Meza in view of Kusuyama under 35 U.S.C. § 103(a).

In "Claim Rejections – 35 USC § 103," item 4 on page 7 of the Office Action, claims 1, 7-9 and 11 have been rejected as being obvious over Japanese Patent No. 63-023993 to Doi et al. (hereinafter Doi) under 35 U.S.C. § 103(a).

In "Claim Rejections – 35 USC § 103," item 5 on pages 8-9 of the Office Action, claims 1 and 7-12 have been rejected as being obvious over the February, 2002 University of Auckland Theses by Bader in view of either German Patent Application DE 196 30 073A1 to Eska et al. (hereinafter Eska) or U.S. Patent No. 6,130,265 to Glueck et al. (hereinafter Glueck) under 35 U.S.C. § 103(a).

In "Claim Rejections – 35 USC § 103," item 6 on page 9 of the Office Action, claims 3 and 4 have been rejected as being obvious over Bader in view of either Eska or Glueck and further in view of U.S. Publication No. 2002/0033247 to Neuschutz et al. (hereinafter Neuschutz) under 35 U.S.C. § 103(a).

In "Claim Rejections – 35 USC § 103," item 7 on pages 9 - 10 of the Office Action, claim 13 has been rejected as being obvious over Bader in view of either Eska or Glueck and further in view of U.S. Patent No. 3,361,684 to Chvatal et al. (hereinafter Chvatal) under 35 U.S.C. § 103(a).

In "Claim Rejections – 35 USC § 103," item 8 on pages 10-11 of the Office Action, claims 1 and 7-11 have been rejected as being obvious over Xiao et al. (Energy Conversion and Management, January 2002, (43), Pages 103-108) in view of Eska under 35 U.S.C. § 103(a).

In "Claim Rejections – 35 USC § 103," item 9 on pages 11-12 of the Office Action, claims 3-4 have been rejected as being obvious over Xiao in view of Eska and Neuschutz under 35 U.S.C. § 103(a).

In "Claim Rejections – 35 USC § 103," item 10 on page 12 of the Office Action, claims 12-13 have been rejected as being obvious over Xiao in view of Eska and either U.S. Patent No. 5,882,570 to Hayward or Chvatal under 35 U.S.C. § 103(a).

The rejections have been noted and the claims have been amended in an effort to even more clearly define the invention of the instant application.

Support for the changes to the claims is found in original claim 8 calling for a method for producing a heat storage device and in the Specification of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 1 calls for, *inter alia*, a heat storage device, comprising:

a heat storage material mixture having an amount of a phase change material and an amount of particulate expanded graphite mixed with said phase change material,

wherein the expanded graphite is present in an amount of 5 to 40% by volume and is formed of particles comprising comminuted, compacted expanded graphite product with a bulk density of from 60 to 200 g/l and a mean particle diameter of 5  $\mu$ m to 5 mm.

Method claim 8 is dependent on claim 1 and therefore contains similar language.

Claims 2, 3 and 7 have been amended to be consistent with the changes in claim 1.

As indicated above, claims 1, 3, 4 and 7 are now directed to a heat storage device comprising a heat storage material mixture. Claims 8-13 are now directed to a method for producing a heat storage device, which comprises mixing an amount of expanded graphite and an amount of phase change material to produce the heat storage device according to claim 1.

Applicants believe that the prior art cited previously against the claims directed to a material mixture do not anticipate or render obvious the amended claims calling for a heat storage device comprising a heat storage material mixture and method. It is noted in this regard that the "heat storage" wording is present in the body of both claims 1 and 8.

None of the Kusuyama, Meza, Doi, Glueck or Chvatal references cited against the claims of the instant application teaches a heat storage device containing a heat storage material mixture as in claim 1 of the instant invention.

For example, the Kusuyama reference discloses a gasket which is not a heat storage device and cannot be used as such.

Therefore, independent of the material properties described in those references, the subject matter of claim 1 as well as claim 8 is novel and non-obvious in view of the prior art.

Eska describes a heat or cold storage system which includes a matrix of pressed expanded graphite. Eska does not describe a material mixture as in claim 1 of the instant application.

The allegations of the Examiner that a person skilled in the art would adopt the material properties of Kusuyama, Meza, Doi, Glueck, Xiao and Chvatal to the heat or cold storage system of Eska can only be based on the Examiner's knowledge of the present invention. That, however, is an inadmissible ex-post facto consideration.

The reasons for using the materials as described in the prior art references depend only on the application of the products described in those references, such as sealing properties for gaskets (Kusuyama) or shielding properties against thermal neutrons (Chvatal). Those properties, however, have nothing in common with properties that material mixtures for heat storage devices need to have according to the present invention.

Furthermore, starting from Meza, the Examiner argues that on the basis of a concern about dust generated by handling graphite, a person skilled in the art would optimize the bulk density and/or particle size of e.g. powder by routine experimentation.

Such considerations, however, again seem to be based on an ex-post facto analysis which is only possible after the Examiner has had knowledge of the present invention. No person skilled in the art would, just for the sake of dust

reduction, completely change properties of compounds and thus properties of resulting materials. Even for Meza, dust generation is only a minor point that can be easily circumvented by premixing the graphite in a polymer-filler mix. Meza does not make any suggestion of further trying to reduce generation of dust by other methods than mixing and for that purpose entering into a larger series of experiments. Meza especially does not make a point of changing densities or particle sizes of the graphite being used.

Clearly, none of the references teaches a heat storage device comprising a heat storage material mixture having a phase change material and an amount of particulate expanded graphite mixed with the phase change material in the amount, content, density and size as recited as recited in claims 1 and 8 of the instant application.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the limitations of claims 1 and 8. Claims 1 and 8 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claims 1 or 8.

In view of the foregoing, reconsideration and allowance of claims 1, 3, 4 and 7-13 are solicited.

Appl. No. 10/695,367  
Amdt. dated 2/18/09  
Reply to Office action of 8/18/08

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

Petition for extension is herewith made. The extension fee for response within a period of three months pursuant to Section 1.136(a) in the amount of \$1,110.00 in accordance with Section 1.17 is enclosed herewith.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to Deposit Account Number 12-1099 of Lerner Greenberg Sterner LLP.

Respectfully submitted,

/Laurence A. Greenberg/  
Laurence A. Greenberg  
Reg. No.: 29,308

LAG/lq

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Lerner Greenberg Sterner LLP  
P.O. Box 2480  
Hollywood, Florida 33022-2480  
Tel.: (954) 925-1100  
Fax: (954) 925-1101